

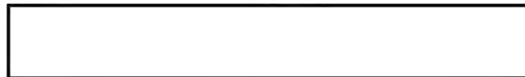
WORK STATUS REPORT

JS-508

Period: May 1 through May 31, 1967

MICRODENSITOMETER SUPPORT

by

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June 9, 1967

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Declass Review by NGA/DOD

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INTRODUCTION

This progress report covers the period from 1 May through 31 May 1967. The financial information included in this report is for the entire contract period from 2 November 1966 through 30 April 1967.

PROGRESS DURING THE PERIOD

Theoretical procedures have been developed for producing sensitometric wedges on individual dye layers and for checking the dynamic modulation of individual dye layers. The collimator design was checked on the optical bench. As a result, a need for a minor modification in the collimator design was identified and suitable corrective actions have been taken. At the present time it appears that a problem may occur with regard to uniformity of the illumination.

The complete procedure for determining effective exposure was developed. This procedure involves discarding the standard photometric exposure, as presently used, and recalibrating the sensitometer in terms of radiant, analytically weighted exposure. The computer program for the calibration is currently being written. The entire effective exposure concept is based on taking account of the spectral properties of both subject and film in the sensitometric calibration, followed by an eigenvector analysis of the resulting characteristic curve. It should be mentioned that this procedure looks promising as an operational tool for the target signature problem.

The work on the sine wave analysis program during the present period has been concentrated in two areas. The first area concerns improving the conventional color sensitometric techniques to provide a more valid basis for calibrating the color microdensitometer in terms of effective exposure. More specifically, this effort was directed at obtaining a good simulation of the light source on the optical bench and at obtaining a better separation between the red- and green-sensitive layers of SO-151 STATINTL
X) film.

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The test results indicate that a 65 gelatin filter, together with the usual sharp cutoff interference filter, produces a one-stop improvement in the separation of the red- and green-sensitive layers.

The second area of effort was concerned with the generation of a complete set of blue and green sine waves on SO-151 film. The set includes an exposure series at each of the following spatial frequencies: 5.9, 11.8, 20, 40, 60 and 80 cycles/mm. Suitable lines of the mercury spectrum were used for each color.

A mercury-cadmium source has been ordered. This will provide a suitable red line for independently exposing the red-sensitive layer. Some difficulty may be encountered in using this source since its relatively low intensity will necessitate a long exposure time. However, the source is inexpensive and some preliminary work indicates that it may be possible to increase the aperture of the optical system.

WORK PLANNED FOR NEXT PERIOD

1. The computer programming effort will continue.
2. Raw exposure calibration of sensitometer will be made.
3. Calibration of SO-151, SO-155, 8442, 8443 films will be performed.
4. Completion of the data set for the green sine waves.
5. Begin generation of red sine waves when mercury-cadmium source is received.
6. Continue the digital Micro-Analyzer tracing.

FINANCIAL INFORMATION

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Total amount authorized	<div style="border: 1px solid black; width: 100px; height: 100px;"></div>
Total amount expended through April 30, 1967	
Total amount remaining as of April 30, 1967	
Total man-hours expended through April 30, 1967	